UNIBLITZ®
Shutter Systems
1.800.828.6972

User Manual

D880C Constant Current Shutter Driver

14-0010

Version 2.00

2013

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Version 2.00

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Warranty

LIMITED PRODUCT WARRANTY: All Products manufactured by VINCENT ASSOCIATES® (MANUFACTURER) are warranted to meet published specifications and to be free of defects in materials and workmanship as defined in the specifications for 365 days - one year - (WARRANTY PERIOD) from the date of original shipment of the product. DSS series shutters are additionally warranted to achieve two million cycles within the WARRANTY PERIOD (as defined in the CYCLE WARRANTY CRITERION). MANUFACTURER will, at its own option within the WARRANTY PERIOD, repair or replace without charge any listed item discovered to be defective excepting transportation charges. Burned out or otherwise damaged actuator coils are not covered under this warranty. Any defective product returned to the MANUFACTURER must follow the RETURN MATERIAL AUTHORIZATION PROCEDURE as defined below. This warranty does not extend to cover damage resulting from alteration, misuse, negligence, abuse, normal wear and tear, or accident. The MANUFACTURER will consider the return of unused equipment if returned within 30 days from the original date of shipment, subject to a 20% restocking charge. This offer does not apply to used or damaged equipment. This warranty extends only to the original purchase and is not available to any third party, including any purchaser assemblies or other Products of which the goods may become component equipment.

CYCLE WARRANTY CRITERION: One "cycle" is considered one open and one closure of the shutter. DSS Shutter must be operated with the ED12DSS driver or equivalent H-Bridge type shutter driver circuit at +10.7VDC across the actuator coil for the specified duration. DSS Shutter must be operated within the defined environmental, electrical and mechanical specifications as listed on the device's data sheet. After one year (WARRANTY PERIOD), the cycle warranty is null and void. If returned, the device must be accompanied by a written statement indicating the approximate number of cycles contained on the device, include all parameters to which the shutter was operated and follow the RETURN MATERIAL AUTHORIZATION PROCEDURE as defined below.

RETURN MATERIAL AUTHORIZATION PROCEDURE: MANUFACTURER will only accept returned Products from customers that have obtained an RMA (Return Material Authorization) number from the MANUFACTURER. The customer must also include an itemized statement of defect(s). The Product will then be evaluated per the MANUFACTURER'S standard repair guidelines. Any Product which has been returned to the MANUFACTURER but which is found to meet the applicable specifications and not defective in materials and workmanship shall be subject to the MANUFACTURER's standard evaluation charge. The MANUFACTURER assumes no liability for customer returned material.

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Table of Contents

WARRANTY 2
TABLE OF CONTENTS 3
LIST OF FIGURES 4
LIST OF TABLES 4
GENERAL SAFETY SUMMARY 5
- Injury Precautions 5
- Product Damage Precautions 5
- Safety Terms and Symbols 6

INTRODUCTION 7
D880C FEATURES 8
OPERATING INSTRUCTIONS 9
- Operation 9
- Power Supply Connection 10
- Triggering Methods 10
- Miscellaneous 11
  - Repeat Exposures 11
  - Multiple Simultaneous Shutter Operation 11
  - Synchronization 11
  - External Low Voltage Power Supply Input (Optional) 11
  - Model 710P Cable Layout 12
- Maintenance 13

SPECIFICATIONS 15
- D880C System Characteristics 15
- D880C External Input Characteristics 16
- D880C External Output Characteristics 17
- D880C General Characteristics 18

D880C DIAGRAMS 20
INDEX 23

List of Figures

Figure 1: D880C Control Diagram 20
Figure 2: D880C Jumper Location and Layout 21
Figure 3: D880C Printed Circuit Board Outline Diagram 22

List of Tables

Table 1: 710P Cable Layout for the D880C 12

General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use the product only as specified.

Only qualified personnel should perform service procedures.

Injury Precautions

- **Avoid Electric Overload –** To avoid electrical shock or fire hazard, do not apply a voltage to a terminal that is outside the range specified for that terminal.
- **Avoid Electric Shock –** To avoid injury or loss of life, do not work on or near unit while it is connected to the DC power source.
- **Ground the Product** –Before making connections to the input or output terminals of the product, ensure that the product is properly grounded. **DO NOT DEFEAT THE GROUND CONNECTION.**
- **Do Not operate in Wet/Damp Conditions** – To avoid electric shock, do not operate this product in wet or damp conditions.
- **Do Not Operate in an Explosive Atmosphere** – To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Product Damage Precautions

- **Use Proper Power Source** – Do not operate this product from a power source that applies more than the voltage specified.
- **Provide Proper Ventilation –** To prevent product overheating, provide proper ventilation.
- **Do Not Operate with Suspected Failures –** If you suspect there is damage to this product, have it inspected by qualified service personnel.

Safety Terms and Symbols

These terms appear in this manual:

WARNING	*Warning statements identify conditions or practices that could result in injury or loss of life.*
CAUTION	*Caution statements identify conditions or practices that could result in damage to this product or other property.*

Introduction

The **D880C** is the most advanced drive system available for ***UNIBLITZ™*** shutter units. Its unique design has proven in test after test to provide shutter systems (specified with an "E" designation) an operational life cycle count which exceeds that of the standard capacitive discharge driver. Shutters using this driver type will operate with an extended opening duration due to the reduced pulse voltage amplitude.

The versatility of the **D880C** allows it to operate all apertures in the ***UNIBLITZ™*** line. Dwell time is only limited to the shutter's mechanical ability and not to the charge of a capacitor. A shutter will now operate at different frequencies without a change in rise time. The user can now take complete advantage of the shutter's < 2% repeatability from exposure to exposure, no longer limited by dwell time.

The **D880C**, as with all of our shutter drivers, provides a low voltage output that allows a number of different external triggering methods. This, in addition to the pluggable input/output connector, gives the user a distinct benefit when implementing the unit into a specific application.

Please read the entire manual carefully before attempting to operate the unit.

D880C Features

- Open-frame printed circuit card suitable for OEM applications.
- RoHS compliant.
- Operates CS, LS, VS or XRS series shutters.
- 12-pole pluggable I/O terminal strip connector for wire termination.
- **710P** shutter interconnect cable included.
- Exposure determined by external pulse source for pulse width determined exposure time.
- Operates from user-supplied +24 VDC power supply.
- Employing a proprietary drive system in conjunction with the "E" designation provides a shutter lifetime which can meet or exceed as many as 5 million operations
- Can be factory adjusted for specific pulse current duration.
- Small size allows the unit to be integrated into many space-critical OEM applications.
- D880C Dimensions: 1.0 x 3.2 x 4.0 inches (2.54 x 8.12 x 10.16 cm)

Operating Instructions

Operation

CAUTION

Be sure to observe Electro-Static Discharge (ESD) anti-static unpacking and handling procedures at all times when handling the D880C. Improper handling can result in destruction of the CMOS integrated circuits located on the board surface.

The **D880C** provides the circuitry necessary to efficiently drive ***UNIBLITZ™*** shutter units. By providing the unit with the correct initiating control signal, the shutter can be made to open and close on command. The circuitry is precisely matched to provide ***UNIBLITZ™*** shutters a life time which can meet or exceed as many as 5 million operations?

Prior to the connection of input/output signals to the **D880C,** remove the pluggable I/O connector (P1) from the printed circuit board unit and set printed circuit board unit aside. The P1 connector can be removed by grasping hold of both sides and pulling it away from the printed circuit board. A slight rocking motion from side to side will aid in the plug's removal. Make all connections to P1 connector plug prior to mating it with the printed circuit board unit.

Typical connections will include a +24 VDC power supply and the user specified shutter unit. Additional connections will be determined by the type of triggering needed for your particular application. See Figure 1 to determine your particular controlling method.

Reference Figures 2 and 3, respectively, for proper connections to **D880C**.

Power Supply Connection

Connect the power supply as follows:

CAUTION	***Failure to connect the power supply properly will result in damage to the D880C and/or power supply.***

1. Connect the (+) positive wire (RED) of the supply to PIN #1 of terminal strip P1.
2. Connect the (-) return wire (BLACK) and ground wire (GREEN) of the power supply to PIN #2 of P1.

Triggering Methods

Determine the method of triggering to be used. Please refer to Figure 1, it shows three typical methods of triggering the **D880C**.

- **Simple Switch Contact Closure**: Connect a switch or relay contact as shown in Figure 1. The shutter will open and remain open for as long as the switch is in the closed position.
- **External Pulse Source**: A pulse source can be provided from:
  - Pulse generator
  - Single bit from a computer parallel port
  - Any equivalent pulse source.

  A common ground must be maintained.

  By connecting a pulse source as shown in Figure 1, the shutter will remain open as long as the pulse remains in the high state. When using this method of control, be sure to note the Minimum Exposure Time (MET) of the shutter. If the pulse width input is less than the MET, the shutter may only open partially or not at all. This is true for all triggering methods.
- **Transistor Switch Closure:** Similar to the mechanical switch closure except the correct polarity must be maintained and all grounds must be common. When using the NPN type or an equivalent type of transistor shown, such as an opto-isolator, the collector lead of the transistor must be connected to the +6.75VDC (PIN 4) of the **D880C** and the emitter lead must be connected to the trigger input (PIN 10). Also be sure that the driving circuit ground is connected to the ground (PIN 11) of the **D880C**. If using an equivalent transistor type the maximum input current is 1 mA.

Miscellaneous

Repeat Exposures

The repeat exposure specification listed in this manual is limited by the type of shutter used. At higher frequencies (above 10 Hz) heat can build up in the shutter coil especially if the shutter is subject to limited air flow. This can cause premature failure.

Please contact the factory for specific information concerning shutter modifications and/or drive modifications that may be necessary to operate shutters at their maximum frequency.

Please also note that the shutter outputs are **NOT** fuse protected. This protection must be provided by the user.

Contact the factory for further details regarding specific fuse selection.

CAUTION

Please note that the D880C drive unit is capable of driving only one shutter. Attempting to drive multiple shutters will damage the D880C drive unit and/or shutter. This can also overload the power and/or the shutters may not operate to published specifications.

Multiple Simultaneous Shutter Operation

Under certain circumstances multiple **D880C** drive units can be operated from one power supply. If the user's requirements do not necessitate shutters to open simultaneously, two drivers may be operated from one supply. It would be advisable to discuss the particular application with one of our technical support representatives.

Synchronization

The **D880C** can be used to operate the Electronic Synchronization system if the Electronic Sync option is available with the selected shutter. The Electronic Sync will provide a signal directly from the shutter mechanism through the **D880C** controller. Please see Figure 3.

When the shutter opens to 90% of full aperture the electronic Sync Output (Pin 12) will provide > 3.5VDC with the shutter in the open position (Logic 1), and < 0.5VDC with the shutter closed (Logic 0).

External Low Voltage Power Supply Input (Optional)

The **D880C** derives its shutter hold voltage from the +24VDC power supply via an on board step-down switching regulator operating at 52 KHz. If this switching frequency will interfere with the user application, the on board regulator can be disabled.

To disable the on board regulator, remove shunt JP1 and place it at JP2. This changes Pin 9 from a ground terminal to a +7.4VDC input and disables the on board regulator, supplies low voltage bias to the circuit, and provides the shutter hold current.

The external supply used must be capable of supplying at least 600 mA for proper operation.

Model 710P Cable Layout

The table below shows the layout of the **710P** cable supplied with the **D880C**.

7-Pin WPI Female Connector	Function	710P Wire Color	D880C Pin Number
A	Shutter Coil	Red	7
B	Shutter Coil	Black	8
C	Sync Control	White	3
D	Ground (circuit)	Green	6
E	Sync Control	Orange	5
F	+6.75VDC	Blue	4
H	Ground (shutter)	Brown	9

Table 1: 710P Cable Layout for the D880C

Maintenance

CAUTION

Be sure to observe Electro-Static Discharge (ESD) anti-static unpacking and handling procedures at all times when handling the D880C. Improper handling can result in destruction of the CMOS integrated circuits located on the board surface.

There are no user-serviceable parts on the **D880C**.

Observe proper handling, care and maintenance of the **D880C**. It is a sensitive electronic instrument.

Although the stability of the drive voltage is checked and calibrated prior to shipment, it may become necessary to make some minor adjustments to the operating systems of the **D880C** over time.

It is highly recommended that if a problem is suspected with the unit that it be returned to the factory for checkout, proper adjustments and calibration. Failure to do this may damage the unit's circuitry and/or functionality and will void the factory warranty.

NOTES

Specifications

D880C System Characteristics

Name	Description
Repeat Exposure	Minimum time between exposures is determined by shutter used.
Shutter Drive	• Continuously variable exposure frequency from DC to the shutter's maximum rate. • Pulse Current: 1.2 A • Hold Current: 300 mA
Power Supply	• +24 VDC regulated ±2% • 1.5 A, minimum • User Supplied

D880C External Input Characteristics

Name	P1 Pin	Function	Description
Signal Input	10	Input impedance	20 K ohms
		Max. input voltage	+20 VDC (100% duty cycle).
		Min input voltage necessary to ensure triggering	+1.5 VDC
		Nominal input trigger voltage	+5 VDC logic signal (TTL or CMOS)
		Min pulse width	Determined by shutter used
		Max. pulse width	Determined by exposure time desired
		Input signals	Can be provided from most pulse sources or from mechanical/electronic switch contact closures
Power Requirements	1	Operating a shutter to max frequency response (determined by shutter used).	+24 VDC/1.5 ADC
		Single exposures or for low frequency requirements	1.5 ADC/50ms
External Low Voltage Input **(Note: Remove shunt from JP2 Pins 1 & 2, move to JP2 Pins 3 & 4 to activate this input)**	9	External shutter hold	+7.4 VDC/600 mA DC Will also disable on board switching regulator **(Note: with shunt in JP2 Pins 1 & 2, Pin 9 is a ground point. Be sure that two shunts are not in at the same time.)**
Sync Control	5	Electronic Synchronization System	Connects to detector of shutter's synchronization sensor (if so equipped).

D880C External Output Characteristics

Name	Pin	Function	Description
Shutter Output	7	Shutter (A) Send	Proprietary output signal. Provides for extended shutter life.
	8	Shutter (B) Return	Output will follow input signal
Low Voltage Supply Output	4	Remote switching/external circuit bias	+6.75VDC at 50mA available to the user for use in remote switching into signal input and for external circuit biasing.
Electronic Sync Out	12	Output for shutter equipped with electronic sync	Provides output for shutter equipped with electronic sync. System. • <0.5VDC when the shutter is deactivated • >3.5VDC when the shutter is activated. • Active-high or active-low selection by Jumper JP3.
Sync Control	3	Electronic Synchronization System	Connects to emitter of shutter's synchronization sensor (if so equipped)

D880C General Characteristics

Name	Description
Size (HWD)	1.0 x 3.2 x 4.0 inches (2.54 x 8.12 x 10.16 cm)
Weight	3 oz.(.09 kg)
Input/Output Connector	12 pole in-line pluggable terminal strip. Wire size - 12AWG max
P1 Connections	• Pin 1 Input +24 VDC (Regulated) • Pin 2 Passive Power Ground • Pin 3 Output Sync control; White wire 710P • Pin 4 Output +6.75 VDC (Regulated); Blue wire of 710P • Pin 5 Input Sync control; Orange wire of 710P • Pin 6 Passive Sync Ground; Green wire of 710P • Pin 7 Output Shutter (A); Red wire of 710P • Pin 8 Output Shutter (B); Black wire of 710P • Pin 9 Passive Ground when shunt in JP2 Pins 1,2; Brown wire of 710P • Pin 9 Input 7.4 VDC (600 mA) input when shunt in JP2 Pins 3,4 • Pin 10 Input Trigger input • Pin 11 Passive Signal Ground • Pin 12 Output Electronic sync output Notes: 1. P1 connections: Proper JP1 selection must be made for proper shutter operation. Please see JUMPER SELECTIONS, below. 2. Pins 3,4,5,6: Used only when shutter is equipped with electronic sync. 3. Pin 9: Used for shutter frame grounding or external low

	voltage input, jumper selectable. 4. Pin 12: Active-high or active-low output when electronic sync is activated, jumper selectable. 5. Pin 10: Trigger input: Minimum voltage 1.5 VDC, maximum voltage 20 VDC, active-high only. 6. P1 plug is removable.
Jumper Selections	
JP1 (Please refer to Figure 2)	• Pin 1, 2 LS2 Shutter • Pin 3, 4 LS3/LS6 Shutter • Pin 5, 6 VS14 Shutter • Pin 7, 8 VS25/CS25 Shutter • Pin 9, 10 VS35/CS35 Shutter • Pin 11, 12 CS45/CS65 Shutter • Pin 13, 14 Adjustable For Special Device
JP2 (Please refer to Figure 2)	• Pin 1, 2 Pin 9 Is Ground • Pin 3, 4 Pin 9 Is 7.4 VDC (600 mA) Input; On-Board Step Down Switching Regulator Is Disabled.
JP3 (Please refer to Figure 2)	• Pin 1, 2 Sync Output Is Active-High • Pin 3, 4 Sync Output Is Active-Low

D880C Diagrams

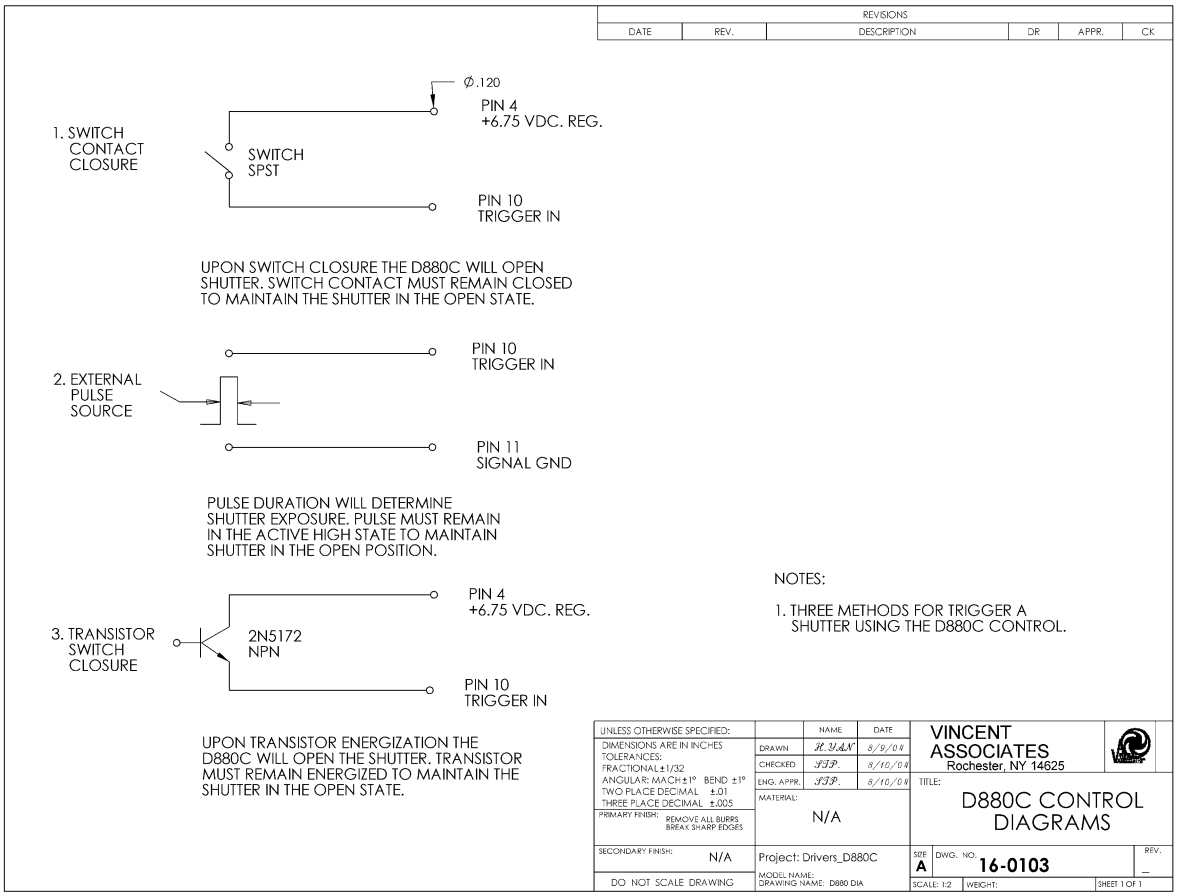

Figure 1: D880C Control Diagram

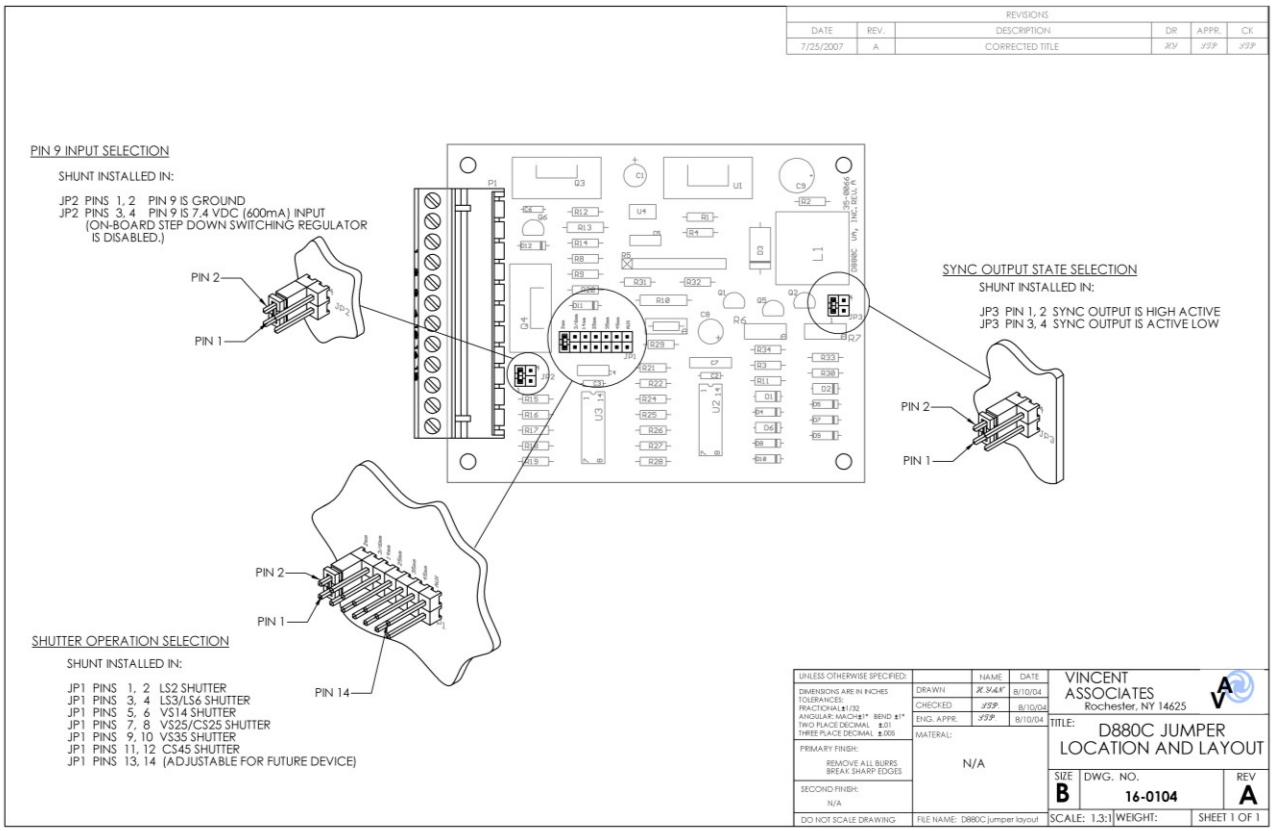

Figure 2: D880C Jumper Location and Layout

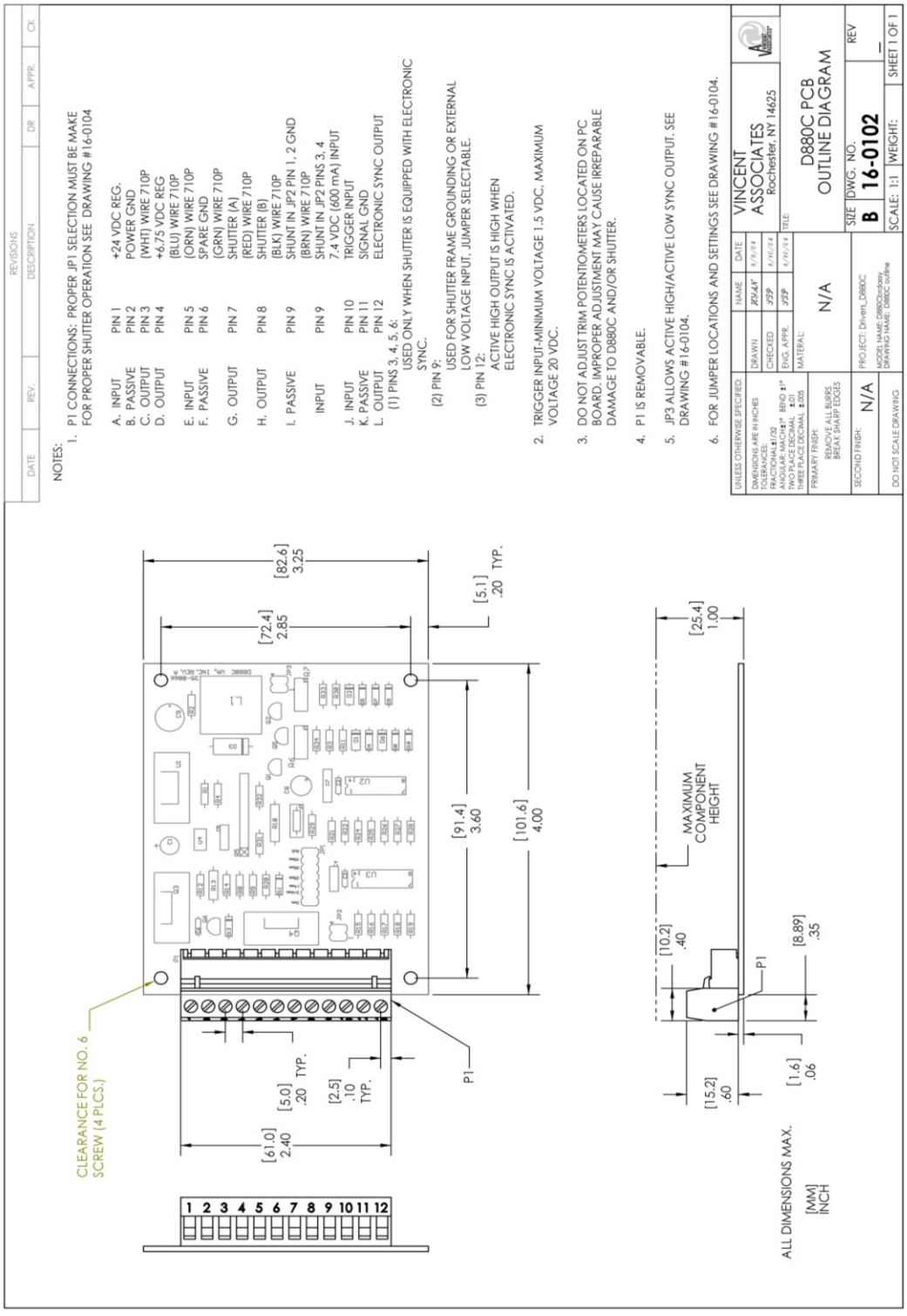
REVISIONS
DATE
REV.
DESCRIPTION
DR
APPR.
CK
NOTES:
1. P1 CONNECTIONS: PROPER JP1 SELECTION MUST BE MAKE FOR PROPER SHUTTER OPERATION SEE DRAWING #16-0104
A. INPUT PIN 1 +24 VDC REG.
B. PASSIVE PIN 2 POWER GND
C. OUTPUT PIN 3 (WHT) WIRE 710P
D. OUTPUT PIN 4 +6.75 VDC REG (BLU) WIRE 710P
E. INPUT PIN 5 (ORN) WIRE 710P
F. PASSIVE PIN 6 SPARE GND (GRN) WIRE 710P
G. OUTPUT PIN 7 SHUTTER (A) (RED) WIRE 710P
H. OUTPUT PIN 8 SHUTTER (B) (BLK) WIRE 710P
I. PASSIVE PIN 9 SHUNT IN JP2 PIN 1, 2 GND (BRN) WIRE 710P
INPUT PIN 9 SHUNT IN JP2 PINS 3, 4 7.4 VDC (600 mA) INPUT
J. INPUT PIN 10 TRIGGER INPUT
K. PASSIVE PIN 11 SIGNAL GND
L. OUTPUT PIN 12 ELECTRONIC SYNC OUTPUT
(1) PINS 3, 4, 5, 6: USED ONLY WHEN SHUTTER IS EQUIPPED WITH ELECTRONIC SYNC.
(2) PIN 9: USED FOR SHUTTER FRAME GROUNDING OR EXTERNAL LOW VOLTAGE INPUT, JUMPER SELECTABLE.
(3) PIN 12: ACTIVE HIGH OUTPUT IS HIGH WHEN ELECTRONIC SYNC IS ACTIVATED.
2. TRIGGER INPUT-MINIMUM VOLTAGE 1.5 VDC, MAXIMUM VOLTAGE 20 VDC.
3. DO NOT ADJUST TRIM POTENTIOMETERS LOCATED ON PC BOARD. IMPROPER ADJUSTMENT MAY CAUSE IRREPARABLE DAMAGE TO D880C AND/OR SHUTTER.
4. P1 IS REMOVABLE.
5. JP3 ALLOWS ACTIVE HIGH/ACTIVE LOW SYNC OUTPUT. SEE DRAWING #16-0104.
6. FOR JUMPER LOCATIONS AND SETTINGS SEE DRAWING #16-0104.
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/32
ANGULAR: MACH ± 1° BEND ± 1°
TWO PLACE DECIMAL ±.01
THREE PLACE DECIMAL ±.005
PRIMARY FINISH:
REMOVE ALL BURRS
BREAK SHARP EDGES
SECOND FINISH: N/A
DO NOT SCALE DRAWING
DRAWN JPG/AF 9/9/14
CHECKED JPG 9/10/14
ENG. APPR. JPG 9/10/14
MATERIAL: N/A
PROJECT: Drivers_D880C
MODEL NAME: D880Cbotstrp
DRAWING NAME: D880C outline
VINCENT ASSOCIATES
Rochester, NY 14625
TITLE: D880C PCB OUTLINE DIAGRAM
SIZE B
DWG. NO. 16-0102
REV _
SCALE: 1:1
WEIGHT:
SHEET 1 OF 1
[82.6] 3.25
[72.4] 2.85
[5.1] .20 TYP.
[91.4] 3.60
[101.6] 4.00
CLEARANCE FOR NO. 6 SCREW (4 PLCS.)
[5.0] .20 TYP.
[2.5] .10 TYP.
[61.0] 2.40
P1
1 2 3 4 5 6 7 8 9 10 11 12
MAXIMUM COMPONENT HEIGHT
[25.4] 1.00
[10.2] .40
[15.2] .60
[1.6] .06
[8.89] .35
ALL DIMENSIONS MAX.
[MM]
INCH

Figure 3: D880C Printed Circuit Board Outline Diagram

Index

+24 VDC, 8, 9

710P, 8, 12
710P Cable Layout, 12

calibration, 13
collector, 10
Control Diagram, 20
CS series shutters, 8
CS25, 19
CS35, 19
CS45, 19
CS65, 19

D880C, 7
Diagrams, 20
Dimensions, 8
drive voltage, 13
Dwell time, 7

Electric Overload, 5
Electric Shock, 5
Electronic Sync Out, 17
Electronic Synchronization, 11
emitter, 10
Explosive Atmosphere, 5
Exposure, 8
External Input Characteristics, 16
External Low Voltage Input, 16
External Low Voltage Power Supply Input (, 11
External Output Characteristics, 17
External Pulse Source, 10
External shutter hold, 16
external triggering, 7

factory warranty, 13
Features, 8
fuse selection, 11

General Characteristics, 18
ground, 5, 10, 19

I/O terminal strip, 8
Injury Precautions, 5
Input impedance, 16
Input signals, 16
input/output connector, 7
Input/Output Connector, 18
Introduction, 7

JP1, 19
JP2, 16, 19
JP3, 19
Jumper Location and Layout, 21
Jumper Selections, 19

low frequency requirements, 16
Low Voltage Supply Output, 17
LS series shutters, 8
LS2, 19
LS3, 19
LS6, 19

Maintenance, 13
max frequency response, 16
Max. input voltage, 16
Max. pulse width, 16
maximum input current, 10
MET, 10
Min input voltage, 16
Min pulse width, 16
Minimum Exposure Time, 10
Multiple Simultaneous Shutter Operation, 11

Nominal input trigger voltage, 16

OEM applications, 8
Operating Instructions, 9
operational life, 7
opto-isolator, 10
Output for shutter equipped with electronic sync, 17

P1, 9, 10
P1 Connections, 18
pluggable I/O connector, 9
Power Requirements, 16
Printed Circuit Board Outline Diagram, 22
pulse current duration, 8

Remote switching/external circuit bias, 17
Repeat Exposure, 15
Repeat Exposures, 11
repeatability, 7

Safety, 6
Shutter (A), 17
Shutter (B), 17
shutter interconnect cable, 8

Shutter Output, 17
Signal Input, 16
Size, 18
Specifications, 15
step-down switching regulator, 11
Suspected Failures, 5
Switch Contact Closure, 10
switching frequency, 11
Sync Output, 19
Synchronization, 11
System Characteristics, 15

Terminal Strip, 10
Transistor Switch Closure, 10
triggering, 9
Triggering Methods, 10

user-serviceable parts, 13

VS series shutters, 8
VS14, 19
VS25, 19
VS35, 19

Weight, 18
Wet/Damp Conditions, 5

XRS series shutters, 8